

WE CLAIM:

1. A method for controllably stopping or slowing a heart intermittently during a medical procedure, comprising:
 - providing a controllable nerve stimulator capable of automatically stopping stimulation of a vagal nerve, the nerve stimulator comprising a nerve stimulation electrode;
 - positioning the nerve stimulation electrode in a position suitable for stimulating a vagal nerve to stop or slow the heart;
 - controllably starting stimulation of the vagal nerve;
 - automatically stopping stimulation of the vagal nerve;
 - continuing to start and stop stimulation of the vagal nerve in order to stop or slow the heart intermittently during the medical procedure.
2. The method of claim 1 wherein the vagal nerve is stimulated using transvascular stimulation.
3. The method of claim 1 wherein the vagal nerve is stimulated using endotracheal stimulation.
4. The method of claim 1 wherein the vagal nerve is stimulated using esophageal stimulation.
5. The method of claim 1 wherein the vagal nerve is stimulated using transcutaneous stimulation.
6. The method of claim 1 wherein the vagal nerve is stimulated using intracutaneous stimulation.
7. The method of claim 1 further comprising delivering at least one drug during the medical procedure.

8. The method of claim 7 wherein the drug is selected from the group consisting of:

a beta-blocker, a cholinergic agent, a cholinesterase inhibitor, a calcium channel blocker, a sodium channel blocker, a potassium channel agent, adenosine, an adenosine receptor agonist, an adenosine deaminase inhibitor, dipyridamole, a monoamine oxidase inhibitor, digoxin, digitalis, lignocaine, a bradykinin agent, a serotonergic agonist, an antiarrhythmic agent, a cardiac glycoside a local anesthetic, atropine, a calcium solution, an agent that promotes heart rate, an agent that promotes heart contractions, dopamine, a catecholamine, an inotrope glucagon, a hormone, forskolin, epinephrine, norepinephrine, thyroid hormone, a phosphodiesterase inhibitor, prostacyclin, prostaglandin and a methylxanthine.

9. The method of claim 7 wherein the drug is naturally occurring.

10. The method of claim 7 wherein the drug is chemically synthesized.

11. The method of claim 1 further comprising stimulating the heart.

12. The method of claim 11 wherein stimulation of the vagal nerve occurs in an inverse relationship to stimulation of the heart.

13. The method of claim 11 wherein the heart is stimulated by pacing.

14. The method of claim 1 wherein the medical procedure is selected from the group consisting of:

surgical procedures, non-surgical procedures, endoscopic procedures, fluoroscopic procedures, stent delivery procedures, aortic aneurysm repairs, cranial aneurysm repairs, delivery of drugs, delivery of biological agents, cardiac surgery with cardiopulmonary bypass circuits, cardiac surgery without

cardiopulmonary bypass circuits, brain surgery, cardiograms, heart valve repair, heart valve replacement, MAZE procedures, transmyocardial revascularization, CABG procedures, beating heart surgery, vascular surgery, neurosurgery, electrophysiology procedures, diagnostic ablation of arrhythmias, therapeutic ablation of arrhythmias, endovascular procedures, treatment of injuries to the liver, treatment of the spleen, treatment of the heart, treatment of the lungs, treatment of major blood vessels, non-invasive procedures, invasive procedures, and port-access procedures.

15. A method of performing a medical procedure, comprising:
providing a nerve stimulator capable of automatically stopping stimulation
of a vagal nerve;
stimulating the vagal nerve to reduce heart rate;
automatically stopping stimulation of the vagal nerve; and
stimulating the vagal nerve a subsequent time in order to reduce heart
rate a subsequent time.

16. The method of claim 15 wherein the vagal nerve is stimulated using
transvascular stimulation.

17. The method of claim 15 wherein the vagal nerve is stimulated using
endotracheal stimulation.

18. The method of claim 15 wherein the vagal nerve is stimulated using
esophageal stimulation.

19. The method of claim 15 wherein the vagal nerve is stimulated using
transcutaneous stimulation.

20. The method of claim 15 wherein the vagal nerve is stimulated using
intracutaneous stimulation.

21. The method of claim 15 further comprising delivering at least one drug during the medical procedure.
22. The method of claim 21 wherein the drug is selected from the group consisting of:

a beta-blocker, a cholinergic agent, a cholinesterase inhibitor, a calcium channel blocker, a sodium channel blocker, a potassium channel agent, adenosine, an adenosine receptor agonist, an adenosine deaminase inhibitor, dipyridamole, a monoamine oxidase inhibitor, digoxin, digitalis, lignocaine, a bradykinin agent, a serotonergic agonist, an antiarrhythmic agent, a cardiac glycoside a local anesthetic, atropine, a calcium solution, an agent that promotes heart rate, an agent that promotes heart contractions, dopamine, a catecholamine, an inotrope glucagon, a hormone, forskolin, epinephrine, norepinephrine, thyroid hormone, a phosphodiesterase inhibitor, prostacyclin, prostaglandin and a methylxanthine.
23. The method of claim 21 wherein the drug is naturally occurring.
24. The method of claim 21 wherein the drug is chemically synthesized.
25. The method of claim 15 further comprising stimulating the heart.
26. The method of claim 25 wherein stimulation of the vagal nerve occurs in an inverse relationship to stimulation of the heart.
27. The method of claim 25 wherein the heart is stimulated by pacing.
28. The method of claim 25 wherein the medical procedure is selected from the group consisting of:

surgical procedures, non-surgical procedures, endoscopic procedures, fluoroscopic procedures, stent delivery procedures, aortic aneurysm repairs, cranial aneurysm repairs, delivery of drugs, delivery of biological agents, cardiac surgery with cardiopulmonary bypass circuits, cardiac surgery without cardiopulmonary bypass circuits, brain surgery, cardiograms, heart valve repair, heart valve replacement, MAZE procedures, transmyocardial revascularization, CABG procedures, beating heart surgery, vascular surgery, neurosurgery, electrophysiology procedures, diagnostic ablation of arrhythmias, therapeutic ablation of arrhythmias, endovascular procedures, treatment of injuries to the liver, treatment of the spleen, treatment of the heart, treatment of the lungs, treatment of major blood vessels, non-invasive procedures, invasive procedures, and port-access procedures.

29. A method of electrically manipulating heart rhythm during therapeutic treatment of a heart, comprising:

providing a nerve stimulator, the nerve stimulator comprising a nerve stimulation electrode;

positioning the nerve stimulation electrode in a position suitable for electrically stimulating a vagal nerve to manipulate heart rhythm;

intermittently starting and stopping electrical stimulation of the vagal nerve subsequent times in order to manipulate heart rhythm during therapeutic treatment of the heart.

30. The method of claim 29 wherein the nerve stimulation electrode is positioned in a transvascular position.

31. The method of claim 29 wherein the nerve stimulation electrode is positioned in an endotracheal position.

32. The method of claim 29 wherein the nerve stimulation electrode is positioned in an esophageal position.

33. The method of claim 29 wherein the nerve stimulation electrode is positioned in a transcutaneous position.

34. The method of claim 29 wherein the nerve stimulation electrode is positioned in an intracutaneous position.

35. The method of claim 29 further comprising delivering at least one drug during treatment of the heart.

36. The method of claim 35 wherein the drug is selected from the group consisting of:

a beta-blocker, a cholinergic agent, a cholinesterase inhibitor, a calcium channel blocker, a sodium channel blocker, a potassium channel agent, adenosine, an adenosine receptor agonist, an adenosine deaminase inhibitor, dipyridamole, a monoamine oxidase inhibitor, digoxin, digitalis, lignocaine, a bradykinin agent, a serotonergic agonist, an antiarrhythmic agent, a cardiac glycoside a local anesthetic, atropine, a calcium solution, an agent that promotes heart rate, an agent that promotes heart contractions, dopamine, a catecholamine, an inotrope glucagon, a hormone, forskolin, epinephrine, norepinephrine, thyroid hormone, a phosphodiesterase inhibitor, prostacyclin, prostaglandin and a methylxanthine.

37. The method of claim 35 wherein the drug is naturally occurring.

38. The method of claim 35 wherein the drug is chemically synthesized.

39. The method of claim 29 further comprising stimulating the heart.

40. The method of claim 39 wherein stimulation of the vagal nerve occurs in an inverse relationship to stimulation of the heart.

41. The method of claim 39 wherein the heart is stimulated by pacing.
42. A method of electrically manipulating cardiac rhythm during a medical procedure, comprising:
 - providing a nerve stimulator, the nerve stimulator comprising a stimulation electrode;
 - positioning the stimulation electrode in a position suitable for stimulating a carotid sinus nerve to manipulate cardiac rhythm;
 - intermittently starting and stopping stimulation of the carotid sinus nerve multiple times in order to manipulate cardiac rhythm during a medical procedure.
43. A method of electrically manipulating cardiac rhythm during a medical procedure, comprising:
 - providing a stimulator, the stimulator comprising a stimulation electrode;
 - positioning the stimulation electrode in a position suitable for stimulating Purkinje fibers to stop or slow cardiac rhythm;
 - intermittently starting and stopping stimulation of the Purkinje fibers multiple times in order to manipulate cardiac rhythm during a medical procedure.
44. A method of electrically manipulating cardiac rhythm during a medical procedure, comprising:
 - providing a stimulator, the stimulator comprising a stimulation electrode;
 - positioning the stimulation electrode in a position suitable for stimulating a junction of an AV node and a His bundle to manipulate cardiac rhythm;
 - intermittently starting and stopping stimulation of the junction of the AV node and the His bundle multiple times in order to manipulate cardiac rhythm during a medical procedure.
45. A method of electrically manipulating cardiac rhythm during a medical procedure, comprising:

providing a stimulator, the stimulator comprising a stimulation electrode;
positioning the stimulation electrode in a position suitable for stimulating a
fat pad associated with AV node to manipulate cardiac rhythm; and
intermittently starting and stopping stimulation of the fat pad associated
with the AV node multiple times in order to manipulate cardiac rhythm during a
medical procedure.

46. A method of electrically manipulating cardiac rhythm during a
medical procedure, comprising:
providing a stimulator, the stimulator comprising a stimulation electrode;
positioning the stimulation electrode in a position suitable for stimulating a
fat pad associated with a SA node to manipulate cardiac rhythm; and
intermittently starting and stopping stimulation of the fat pad associated
with the SA node multiple times in order to manipulate cardiac rhythm during a
medical procedure.